NRR-PMDAPEm Resource

From: Kim, James
Sent: Wednesday, October 08, 2014 3:31 PM
To: Couture III, Philip
Subject: Vermont Yankee - RAI Regarding Request for Exemption to Specific Emergency Planning Requirements (MF3614)

Mr. Couture,

By application, dated March 14, 2014 (Agencywide Documents Access and Management System Accession Number ML14080A141), Entergy Nuclear Operations, Inc. (the licensee) requested exemptions that would allow the licensee to reduce emergency planning requirements and subsequently revise the Vermont Yankee Nuclear Power Station Emergency Plan to reflect the permanently defueled condition of the station. The Nuclear Regulatory Commission (NRC) staff have reviewed the information in the exemption request and determined additional information is required to complete its review. Based on our discussions we understand that a response to the RAI will be provided by November 7, 2014.

Jim Kim
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Vermont Yankee PM
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REQUEST FOR ADDITIONAL INFORMATION

VERMONT YANKEE NUCLEAR POWER STATION

REGUARDING REQUEST FOR EXEMPTION FROM

VARIOUS EMERGENCY PLANNING REQUIREMENTS

(TAC NO. MF3614)

ARCB-RAI-1

Attachment 1, Section IV.C.b, entitled, “Radioactive Waste Handling Accident,“ analyzed the consequences of a radioactive waste handling accident. The purpose of this analysis is to calculate the two hour integrated dose in the direction of the closest site boundary (250 meters away) from dropping a high integrity container (HIC). The accident evaluated the largest liner containing the highest concentration of radioactive materials (dewatered resin containing 19,415 curies of 25 various radionuclides representing the highest activity waste at the facility). The licensee concluded, “The resulting two hour integrated dose at the Site Boundary is projected to be 16.1 millirem TEDE, which is below the EAB limit of 1 rem TEDE.”

Therefore, the U.S. Nuclear Regulatory Commission (NRC) staff needs additional information on the 19,415 curies of each of the 25 various radionuclides representing the highest activity waste at the facility to confirm this result at the Site Boundary. Please provide the activity, in units of Curies, of each radionuclide of the HIC representing the highest activity waste at the facility.

ARCB-RAI-2

The dose criteria specified in Title 10 of the *Code of Federal Regulations*, Section 50.67 (10 CFR 50.67) is in terms of total effective dose equivalent (TEDE). As such, confirmatory calculations are performed in terms of TEDE to compare against the dose acceptance criteria specified in NUREG-0800, Section 15.0.1. This analysis differs from the Environmental Protection Agency (EPA) Protective Action Guide [PAG] and Planning Guidance for Radiological Incidents (a.k.a the EPA PAG Manual) recommendation for a projected whole body dose of 1 to 5 rem total effective dose (TED) over four days. The TEDE is defined as the sum of the effective dose equivalent for external exposures and the committed effective dose equivalent for internal exposures. The projected whole body dose calculation for TED is defined as the sum of the effective dose from external radiation exposure (i.e., groundshine and cloudshine) and the committed effective dose from inhaled radioactive material. Dose
conversion factors (DCF) applied in both analyses convert the estimated environmental exposure to dose in the units of concern. Dose conversion factors acceptable to the NRC staff are derived from data provided in International Commission on Radiological Protection Publication 30, “Limits for Intakes of Radionuclides by Workers” and can be found in Federal Guidance Report 11, “Limiting Values of Radionuclide Intake and Air Concentration and Dose Conversion Factors for Inhalation, Submersion, and Ingestion,” and Federal Guidance Report No. 12, “External Exposure to Radionuclides in Air, Water, and Soil,” for exposure to radionuclides in air, water, and soil.”

While both TEDE and TED calculate dose for external and internal exposure, the underlying dosimetry models used to develop the DCFs are not the same. Specifically, the TED DCF (FRG 13) for the thyroid is higher than the TEDE DCF (FRG11 and 12); resulting in a larger contribution to the total dose. One primary difference between the TED and TEDE thyroid DCF is due to a higher tissue weighting factor specified in ICRP 60 being assigned to the thyroid. Please provide a summary explaining why the use of the EPA PAG dose criteria TED is acceptable in addition to the dose criteria specified in 10 CFR 50.67 which is calculated in terms of TEDE.

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